REMARKS

Claims 1 through 6, 8 through 18, and 21 through 25 are in the application and are presented for consideration. By this amendment, changes have been made to independent claims 1 and 18 to further highlight important features of the invention. Minor changes have been made to other claims to address formal issues. New claims 23 through 25 have been added. New claim 23 corresponds to the main independent claim allowed in the European procedure, with minor changes made relating to form. New claim 24 is similar to subject matter from original claims 2 and 4. New claim 25 is similar to original claim 8.

The drawings have been objected to because there are reference numerals in Figure 4 which are difficult to read.

Applicant submits herewith a replacement sheet and a new sheet which presents Figure 4 without the problems noted. It is requested that the drawing changes be approved.

The abstract of the disclosure is objected to because it contains legal phraseology.

Applicant has changed the Abstract to remove the problems which have been noted. The replacement Abstract is presented on a separate page and forms a part of this response. It is requested that the replacement Abstract be approved.

Claims 2, 7 through 11 and 17 have been objected to based on informalities. These claims have been corrected or canceled.

Claims 1-17 have been rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Applicant has revised the claims paying close attention to the Examiner's comments.

Applicant wishes to thank the Examiner for the careful reading of the claims and for the helpful comments. It is believed that the claims as presented are clear and definite and fully conform with the requirements of the statute.

Claims 1-13 and 15-22 have been rejected under 35 U.S.C. 101 because the claimed invention is directed to non-statutory subject matter.

It is Applicant's position that the claims as now presented are clearly directed to statutory subject matter. Each of the claims includes a combination of features such that the claimed subject matter is not an abstract idea, natural phenomenon or law of nature. The claims as presented clearly produce useful, concrete and tangible results. Accordingly, it is requested that the rejection be removed.

Claims 1,3-6,14,15 and 18-22 have been rejected under 35 U.S.C. 102(b) as being anticipated by U.S. Patent 6,655,922 to Flek.

The amended claims present a combination of features which is clearly neither taught nor suggested by the prior art as a whole including Flek.

Flek discloses a system and method for detecting and diagnosing pump cavitation. This is essentially a control system to avoid cavitation. The system and method include controling the pump by using motor features and variables including information with regard to the particular motor model. This is discussed in column 5, line 52. The power of the pump is determined by measuring current provided to the motor 16. Pump power is computed based on current speed and motor model information. In this way, information is presented to the control system 18 in the form of a signal which is related to computed power. Additionally, Flek provides teachings with regard to measuring the section pressure and measuring the discharge pressure of the pump using sensors. The flow

produced by the pump and the speed of the pump are also measured. However, Flek fails to teach and fails to suggest mathematically linking these variables for achieving at least one comparison value. Flek fails to teach and fails to suggest the crux of the invention.

According to the invention, at least two electrical variables associated with the pump motor are mathematically linked using a motor model. At least one hydraulic or pump variable of the pump is linked in a pump model to provide a pump comparison value. The comparison values or the pump comparison value is compared to predetermined values. The method and the device detect agreement or a difference between the pump comparison value and the predefined value. An error signal is generated upon detecting a difference between the comparison value and the predefined value beyond a certain measure to indicate a faulty function of the pump.

As the prior art fails to teach and fails to suggest the combination as claimed, it is requested that the rejections based on Flek be removed.

Claims 2 and 7 have been rejected under 35 U.5.C. 103(a) as being unpatentable over U.S. Patent 6,655,922 to Flek in view of U.S. Patent 5,447,414 to Nordby.

Nordby is cited for teaching a control method wherein two electrical variables of the motor used by a pump motor are used for controlling the motor. The rejection takes the position that it would have been obvious to modify the pump control method taught by Flek with the motor variables taught by Nordby in order to improve the accuracy and resolution of the control method by providing more inputs. However, the combination would not result in the combination of method steps as claimed and would not result in the device as claimed.

Each of Flek and Nordby teach control systems. The purpose of the systems and methods that are disclosed is to monitor a system and change the system for control purposes. There is no

teaching and no suggestion of using a motor model and a pump model as claimed and there is no teaching and no suggestion of producing one or more comparison value from the pump model (from the mathematical linking) in the comparison step, namely comparing the one or more comparison value with one or more predetermined values related to the normal operation of the pump. Further, instead of controlling based on one or more variables, the invention provides for the generation of an error signal indicating that a fault is present and to provide an indication of faulty function of the pump.

The teachings of the references do not present a prima facie case of obviousness. The invention includes features which are neither taught nor suggested by the prior art as a whole. Accordingly, reconsideration of the rejections is requested.

Applicant requests that the Examiner consider information which has come to Applicant's attention based on an opposition proceeding in the European Patent Office. The prior art or other information is as follows:

EP 1286056A1 – this references already been cited in the present application.

EP 0321245 A2 – this references already been cited in the present application.

WOLFRAM ET AL., *Component-based Multi-model Approach for Fault Detection and Diagnosis of a Centrifugal Pump*, Institute of Automatic Control, Darmstadt University of Technology; American Control Conference, 2001; Proceedings of the 2001, pages 4443-4448, Volume 6, ISBN: 0-78036495-3.

Komponentenbasierte Fehlerdiagnose industrieller Anlagen am Beispiel frequenzumrichtergespeister Asynchronmotoren und Krieselpumpen, Dissertationm TU Darmstadt, VDI Forstschrittsberichte, Reihe 8, Nr. 967, VDI Verlag 2002, Dusseldorf. No translation of this

reference is presently available to Applicant. This reference discloses a component-based fault diagnosis system for industrial plants, using an example of frequency-converter-induction motors.

NOWOTNY ET AL., *Vector Control and Dynamics of AC Drives*, Oxford University Press 1996, ISBN: 019 856439

The European Patent Office opposition proceeding has been brought after issuance of claims in the parallel European patent application. As noted, claims were allowed which include a claim directed to the subject matter of newly present to claim 23. It is Applicant's position that all claims patentably define over the prior art including prior art which is now being considered in the European Patent Office opposition proceeding. Consideration of all the references is requested.

Further and favorable action on the merits is respectfully requested.

Respectfully submitted
for Applicant,

By:_____
John James McGlew
Registration No. 31,903
McGLEW AND TUTTLE, P.C.

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ATTACHMENTS: Replacement Abstract
IDS form
Replacement And New Drawing Sheet

SHOULD ANY OTHER FEE BE REQUIRED, THE PATENT AND TRADEMARK OFFICE IS HEREBY REQUESTED TO CHARGE SUCH FEE TO OUR DEPOSIT ACCOUNT 13-0410.

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McGLEW AND TUTTLE, P.C.
BOX 9227 SCARBOROUGH STATION
SCARBOROUGH, NEW YORK 10510-9227
TELEPHONE: (914) 941-5600
FACSIMILE: (914) 941-5855